

2/23

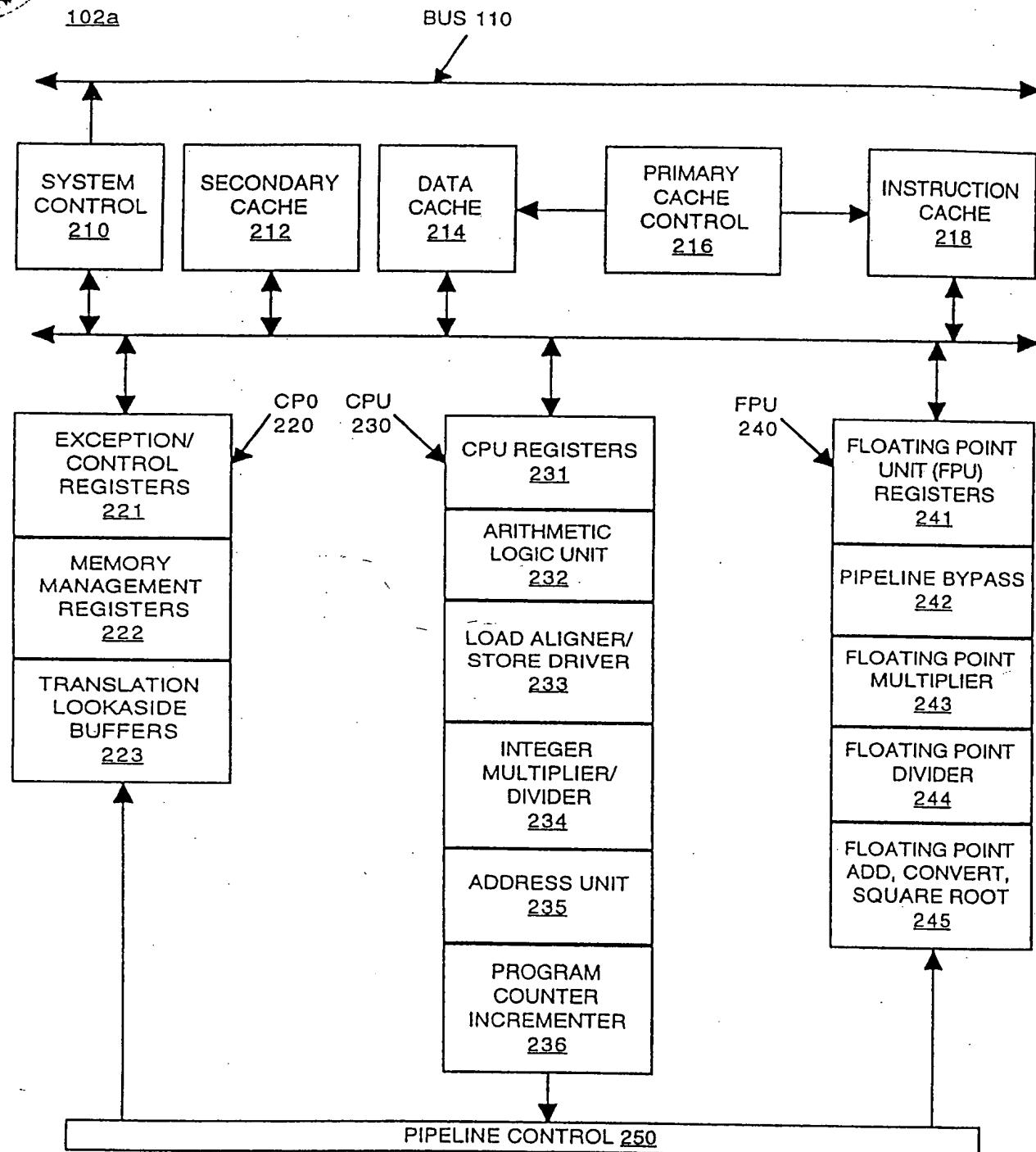


FIG.2A





3/23

102b

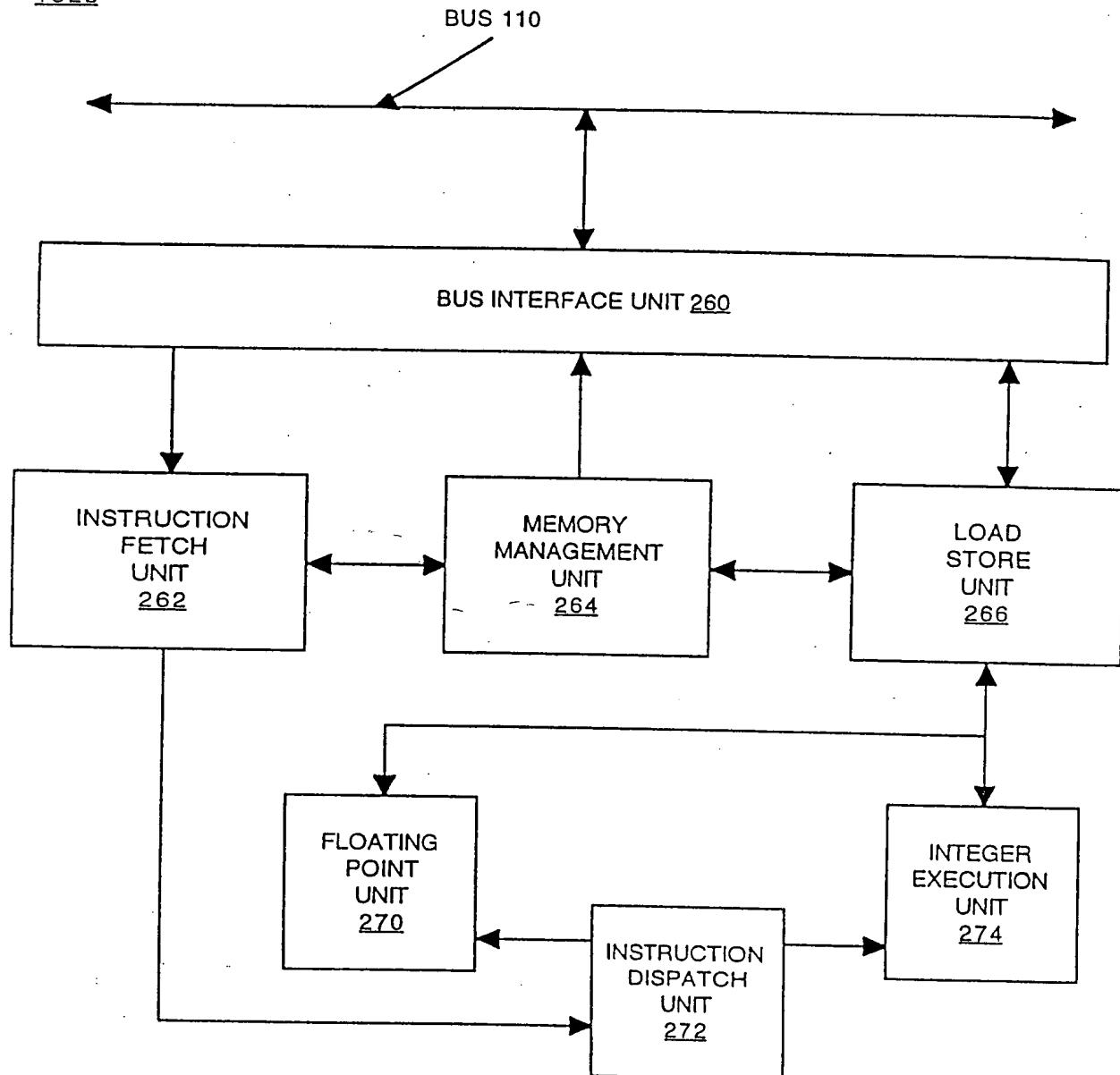


FIG.2B

4/23

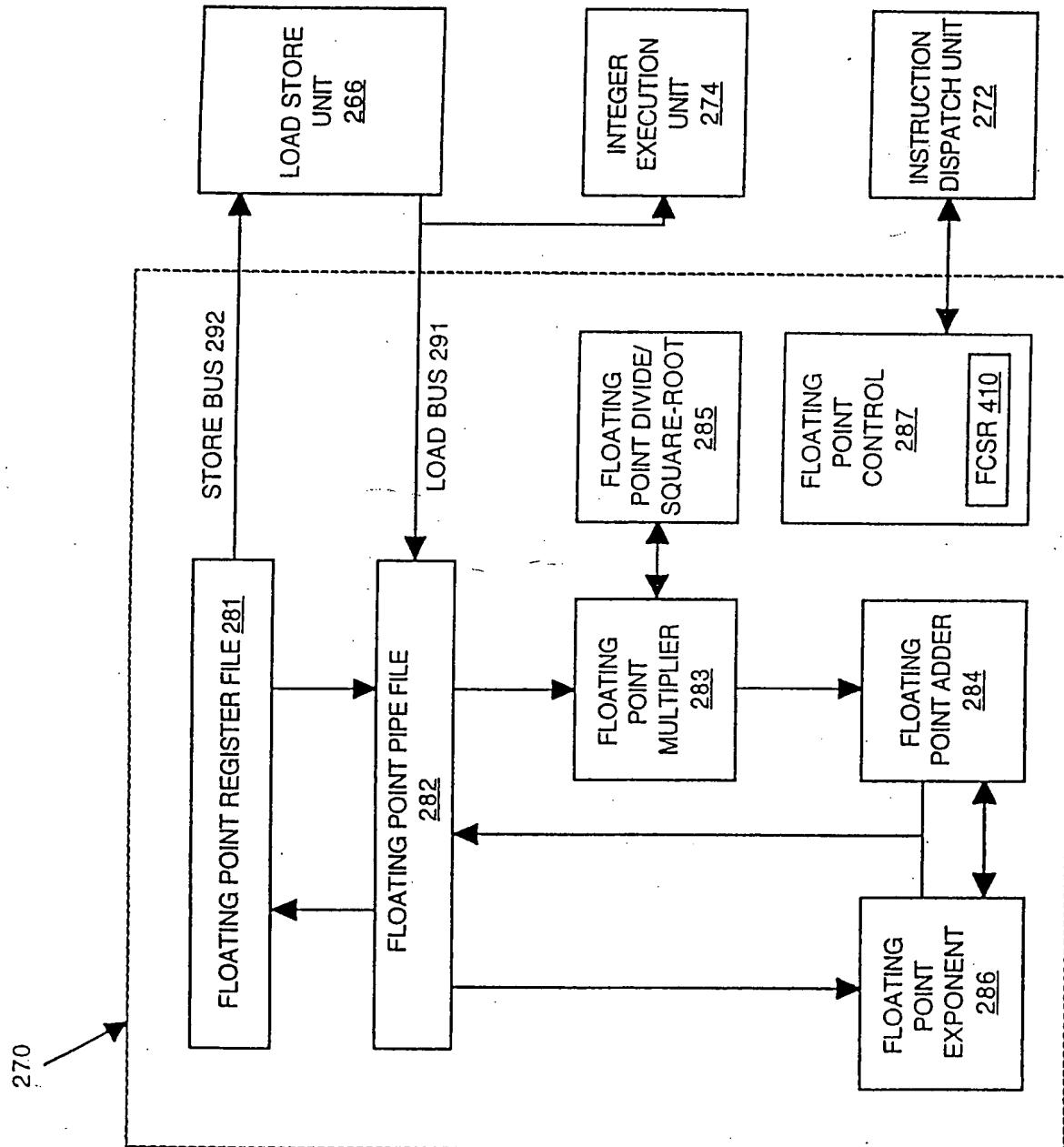


FIG. 2C



5/23

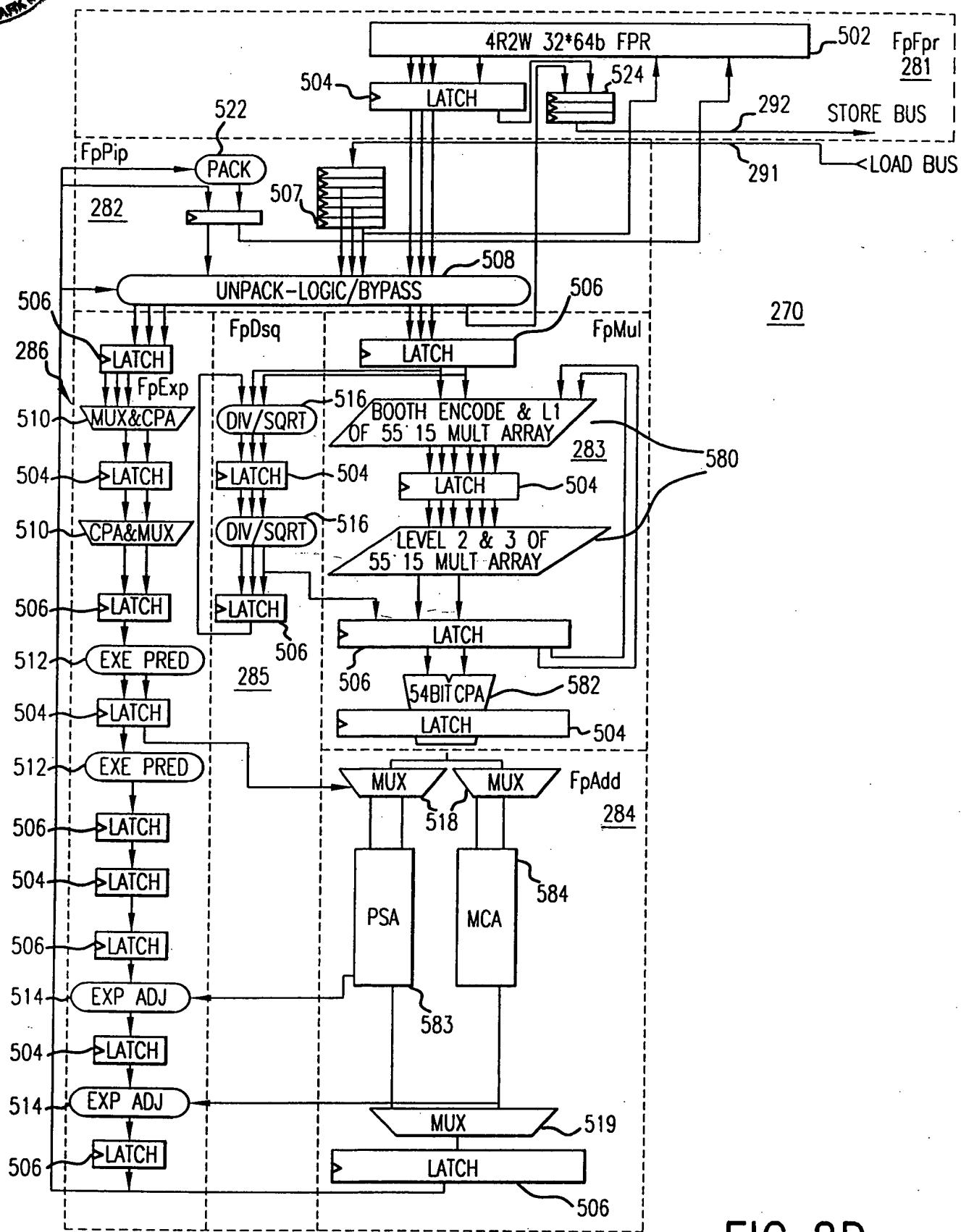


FIG. 2D

6/23

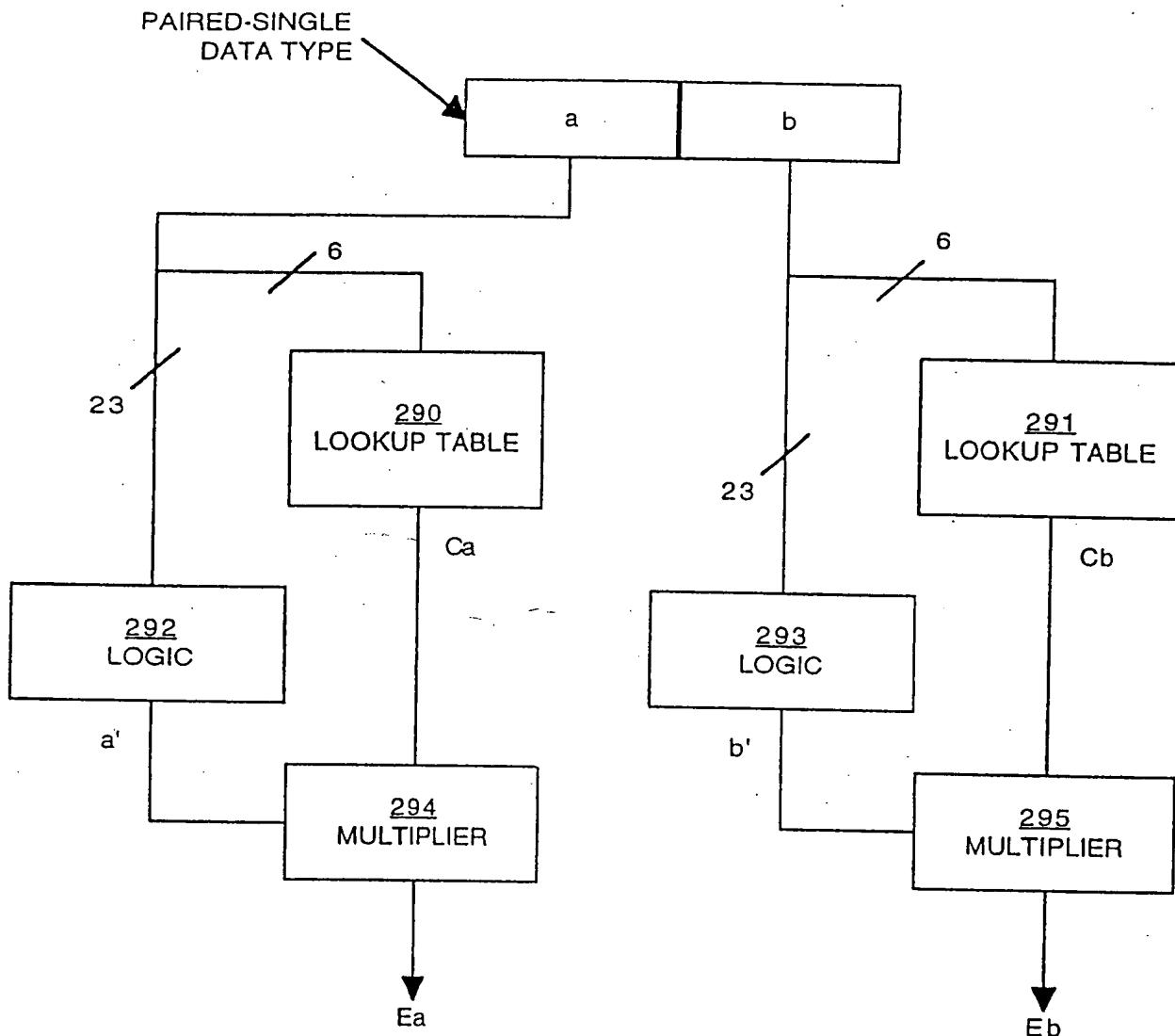


FIG.2E



7/23

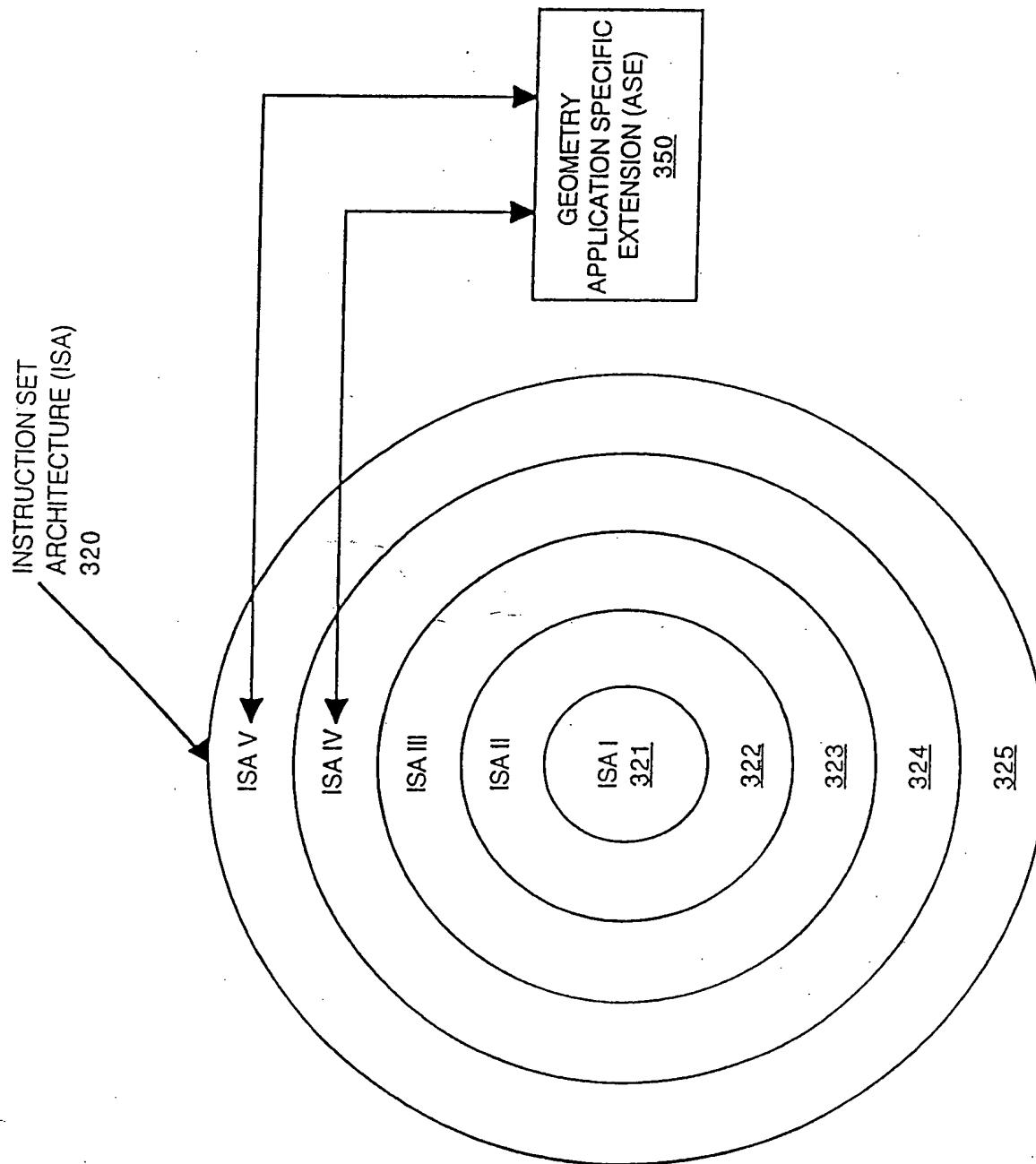


FIG.3



8/23

410

	25	24	23	22	18	17	12	11	7	6	2	1	0
FCC	FS	FCC			CAUSE		ENABLES		FLAGS		RM		
7	1	1	5		6		5		5		2		
					E	V	Z	0	U	1	V	Z	0
7	6	5	4	3	2	1	0		U	1	V	Z	0
31	30	29	28	27	26	25	23		U	1	V	Z	0

FIG.4



9/23

PAIRED SINGLE
DATATYPE 520

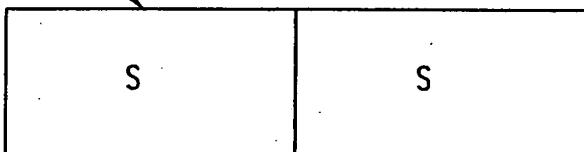


FIG.5



10/23

ADDR 601

31	26 25	21 20	16 15	11 10	6 5	0
	COP1 010001	fmt 10110	ft	fs	fd	ADDR.PS 011000
6	5	5	5	5	5	6

FORMAT: ADDR.PS fd, fs, ft

FIG.6A

MULR 602

31	26 25	21 20	16 15	11 10	6 5	0
	COP1 010001	fmt 10110	ft	fs	fd	MULR.PS 011010
6	5	5	5	5	5	6

FORMAT: MULR.PS fd, fs, ft

FIG.6B



11/23

RECIP1 603

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt	0 00000	fs	fd	RECIP1(fmt 011101)	
6	5	5	5	5	5	6

FORMAT: RECIP1.S fd, fs
RECIP1.D fd, fs
RECIP1.PS fd, fs

FIG.6C

RECIP2 604

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt	ft	fs	fd	RECIP2(fmt 011100)	
6	5	5	5	5	5	6

FORMAT: RECIP2.S fd, fs, ft
RECIP2.D fd, fs, ft
RECIP2.PS fd, fs, ft

FIG.6D



12/23

RSQRT1 605

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt	0 00000	fs	fd	RSQRT1(fmt 011110)	
6	5	5	5	5	6	

FORMAT: RSQRT1.S fd, fs
RSQRT1.D fd, fs
RSQRT1.PS fd, fs

FIG.6E

RSQRT2 606

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt	ft	fs	fd	RSQRT2(fmt 011111)	
6	5	5	5	5	6	

FORMAT: RSQRT2.S fd, fs, ft
RSQRT2.D fd, fs, ft
RSQRT2.PS fd, fs, ft

FIG.6F



13/23

CABS 607

31	26 25	21 20	16 15	11 10	8 7	6 5	4 3	635	630	0
COP1 010001	fmt	ft	fs	cc	0	1	FC 11	cond		
6	5	5	5	3	1	1	2	4		

FORMAT: CABS.cond.S cc, fs, ft
 CABS.cond.D cc, fs, ft
 CABS.cond.PS cc, fs, ft

FIG.6G

CVT.PW.PS 608

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt (PS) 10110	0 00000	fs	fd	CVT.PW.PS 100100	
6	5	5	5	5	6	

FORMAT: CVT.PW.PS fd, fs

FIG.6H



14/23

CVT.PS.PW 609

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt (W) 10101	0 00000	fs	fd	CVT.PS.PW 100110	
6	5	5	5	5	6	

FORMAT: CVT.PS.PW fd, fs

FIG.61



15/23

BC1ANY2F 610

31	26	25	24	21	20	18	17	16	15	0
COP1 010001	0		1001		cc XX0		nd 0	tf 0		OFFSET
6	1	4		3		1	1	1	16	620

FORMAT: BC1ANY2F cc, offset

FIG.6J

BC1ANY2T 611

31	26	25	24	21	20	18	17	16	15	0
COP1 010001	0		1001		cc XX0		nd 0	tf 1		OFFSET
6	1	4		3		1	1	1	16	620

FORMAT: BC1ANY2T cc, offset

FIG.6K

16/23



BC1ANY4F 612

31	26	25	24	21	20	18	17	16	15	0
COP1 010001	0		1010		cc X00		nd 0	tf 0		OFFSET
6	1	4		3		1	1	1	16	620

FORMAT: BC1ANY4F cc, offset

FIG.6L

BC1ANY4T 613

31	26	25	24	21	20	18	17	16	15	0
COP1 010001	0		1010		cc X00		nd 0	tf 1		OFFSET
6	1	4		3		1	1	1	16	620

FORMAT: BC1ANY4T cc, offset

FIG.6M

17/23



PAIRED SINGLE
DATATYPE
ft 721

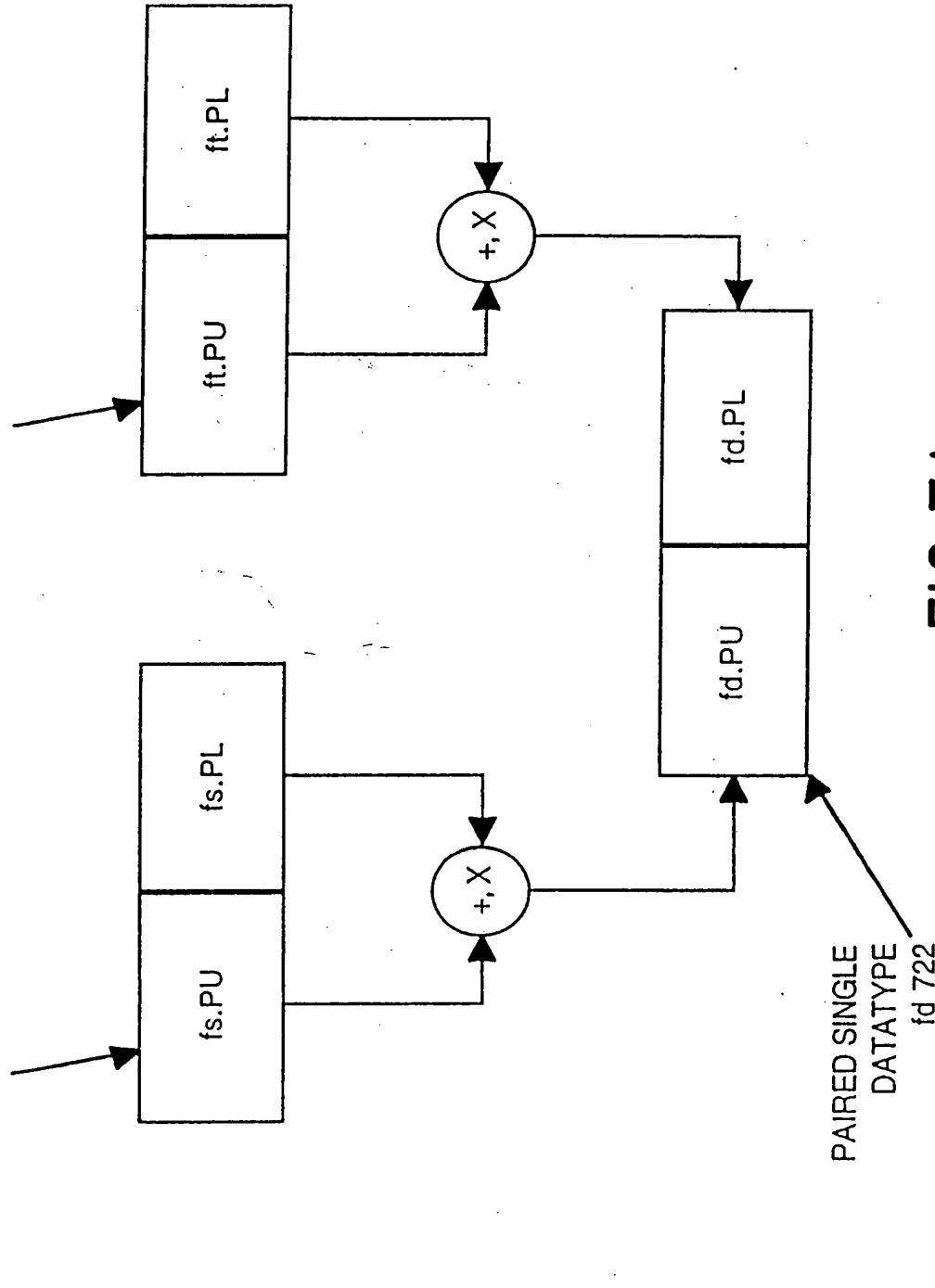
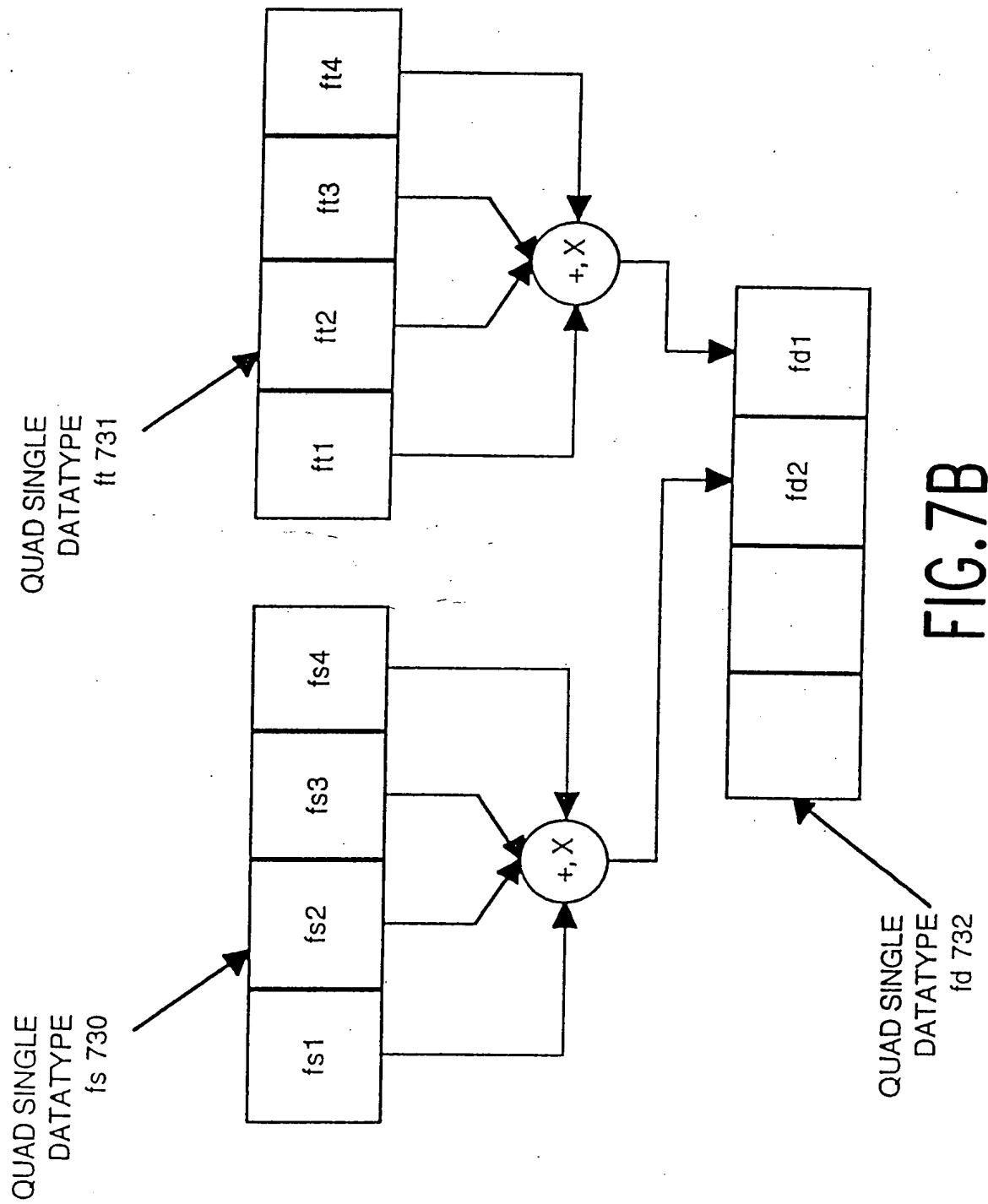


FIG. 7A





19/23

MADD 801

31	26 25	21 20	16 15	11 10	6 5	3 2	0
COP1X 010011	fr	ft	fs	fd	MADD 100	fmt	
6	5	5	5	5	5	3	3

FORMAT: MADD.S fd, fr, fs, ft
MADD.D fd, fr, fs, ft
MADD.PS fd, fr, fs, ft

FIG.8

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt	ft	fs	fd	MUL 000010	
6	5	5	5	5	5	6

FORMAT: MUL.S fd, fs, ft
MUL.D fd, fs, ft
MUL.PS fd, fs, ft

FIG.9

Inventors: Thekkath et al.
Appl. No. 09/364,786
Sheet 20 of 23
REPLACEMENT SHEET



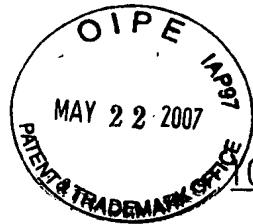
20/23

CVT.PS.S 1001

31	26 25	21 20	16 15	11 10	6 5	0
COP1 010001	fmt 10000	ft	fs	fd	CVT.PS 100110	
6	5	5	5	5	5	6

FORMAT: CVT.PS.S fd, fs, ft

FIG.10



21/23

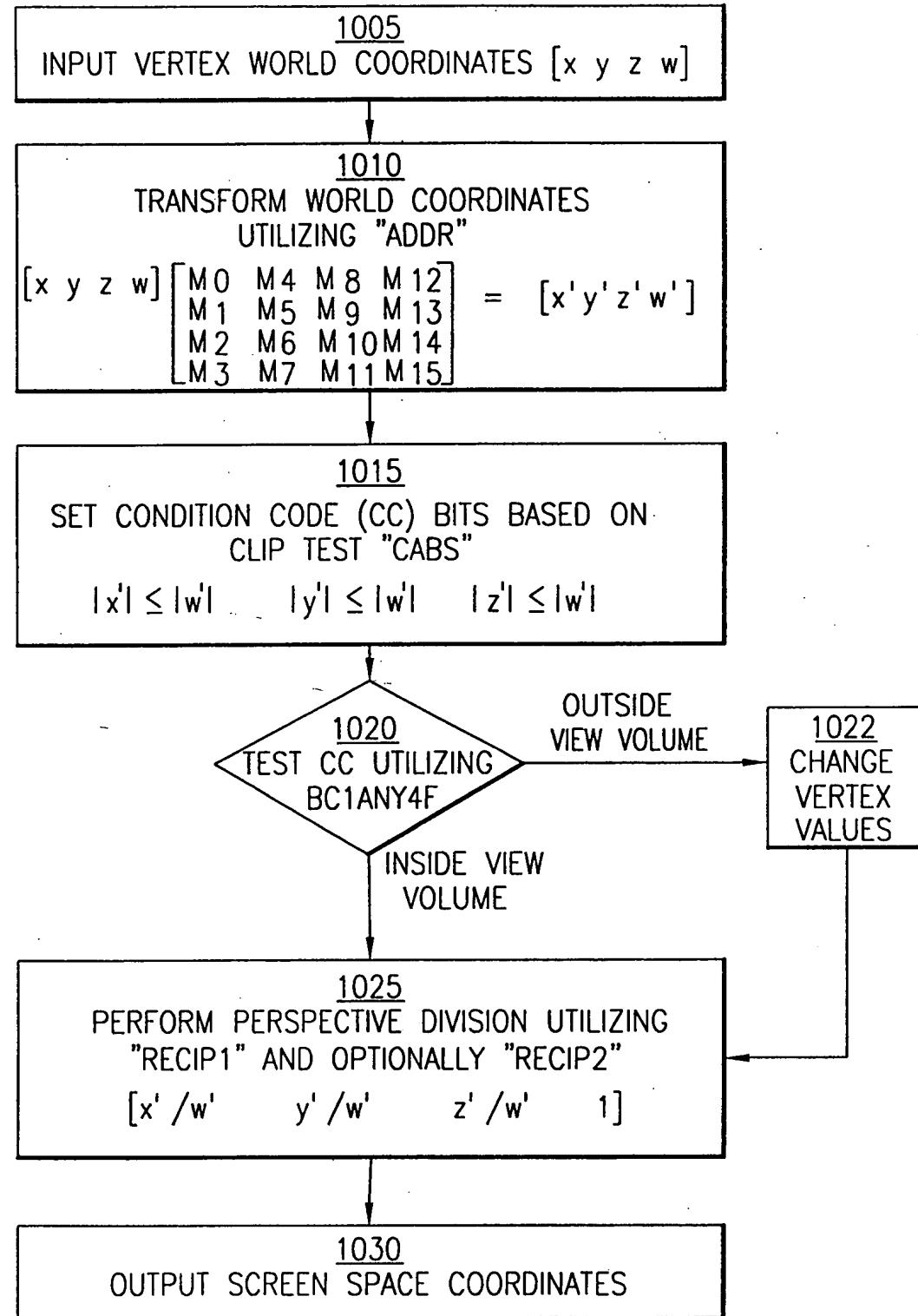


FIG. 11A



1100

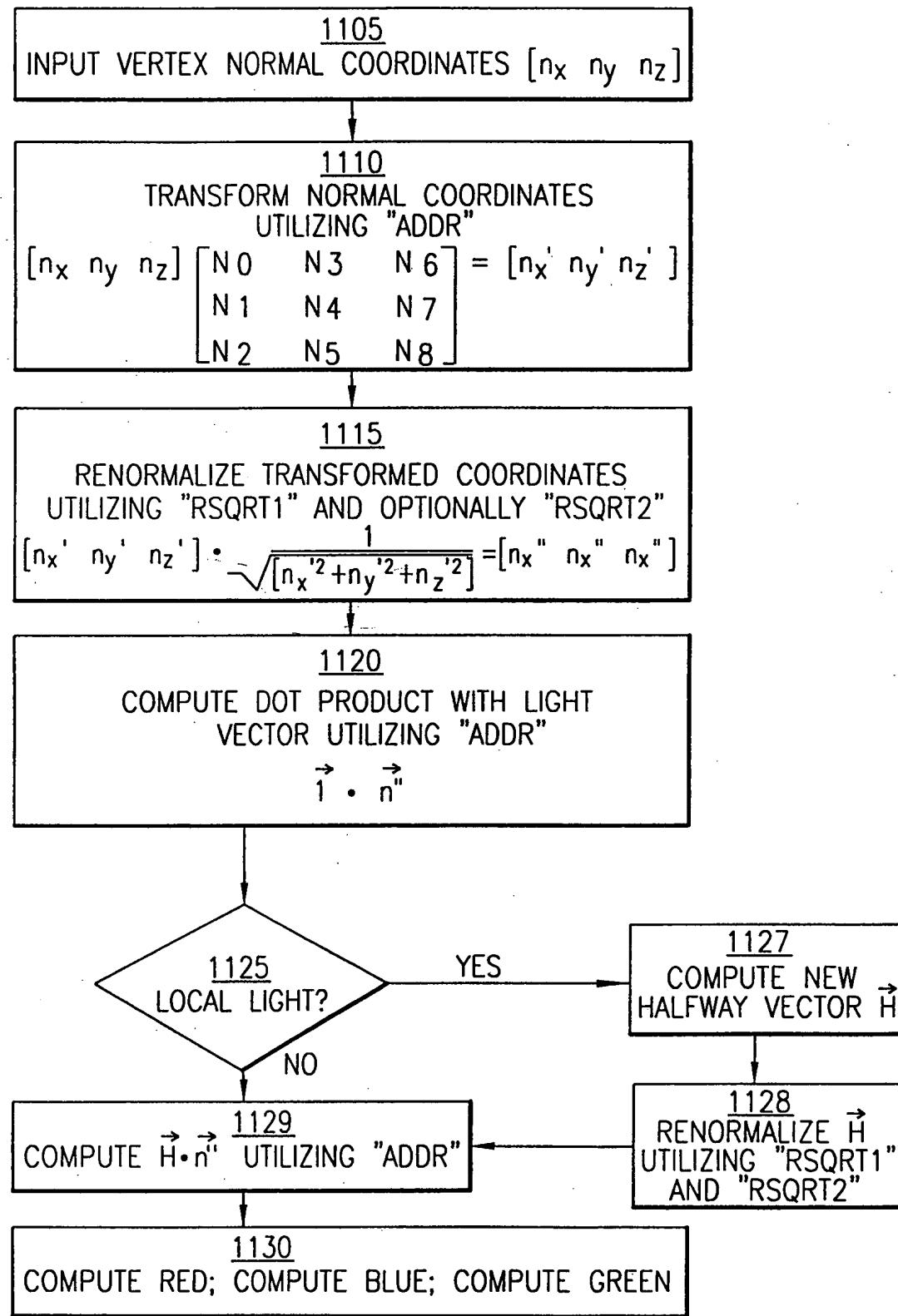


FIG. 11B



23/23

3D MATRIX TRANSFORM

```

# fp0-fp7 CONTAIN THE 4x4 MATRIX IN PAIR SINGLE FORMAT
# BASE CONTAINS THE ADDRESS OF THE NEXT VECTOR AS TWO PAIR SINGLE VALUES
 1d    fp10, 0(base)      # fp10: y || x
 1d    fp11, 8(base)      # fp11: w || z
# fp10 AVAILABLE HERE ASSUMING L1 CACHE HIT. USE PREFETCH TO ACCOMPLISH THIS
  mul.ps fp14, fp10, fp4   # fp14: M9y || M8x
  mul.ps fp15, fp10, fp6   # fp15: M13y || M12x
  mul.ps fp12, fp10, fp0   # fp12: M1y || M0x
  mul.ps fp13, fp10, fp2   # fp13: M5y || M4x
# fp14 AVAILABLE HERE
  madd.ps fp14, fp14, fp5   # fp14: M11w+M9y || M10z+M8x
  madd.ps fp15, fp15, fp7   # fp15: M15w+M13y || M14z+M12x
  madd.ps fp12, fp12, fp1   # fp12: M3w+M1y || M2z+M0x
  madd.ps fp13, fp13, fp3   # fp13: M7w+M5y || M6z+M4x
ssnop
# fp14, fp15 AVAILABLE HERE
  addr.ps fp11, fp15, fp14  # fp11: w' || z'
# fp11: M15w+M14z+M13y+M12x || M11w+M10z+M9y+M8x
# fp12, fp13 AVAILABLE HERE
  addr.ps fp10, fp13, fp12  # fp10: y' || x'
# fp10: M7w+M6z+M5y+M4x || M3w+M2z+M1y+M0x

```

FIG. 12